

We Claim:

1. An embolic filtering system for use in a body lumen, comprising:
a self-expanding strut assembly including a nickel-titanium alloy, wherein the alloy includes a ternary element selected from the group of elements consisting of platinum, palladium, or tantalum, and wherein the alloy further includes a hysteresis curve with a loading plateau at about 100 ksi to 110 ksi and an unloading plateau at about 55 ksi to 100 ksi; and
a filter element disposed on the strut assembly.
2. The embolic filtering system of claim 1, wherein the system includes an elastic sheath at least partially overlying the filter element.
3. The embolic filtering system of claim 2, wherein the self-expanding strut assembly is cut from a tube with truncated diamond shape openings.
4. The embolic filtering system of claim 1, wherein the self-expanding strut assembly when deployed has a generally conical shape with a first base, and the filter element when deployed has a generally conical shape with a second base, and wherein the first and second bases are joined.
5. The embolic filtering system of claim 1, wherein the self-expanding strut assembly includes a strut pattern that is laser cut from a tube.
6. The embolic filtering system of claim 1, wherein the alloy includes a transition temperature set below human body temperature.
7. The embolic filtering system of claim 1, wherein the hysteresis curve includes about a 2:1 ratio of loading stress to unloading stress.
8. The embolic filtering system of claim 1, wherein the nickel-titanium alloy exhibits superelasticity while inside the body lumen.
9. A filtering system for use in a body lumen, comprising:
a self-expanding strut assembly including a nickel-titanium alloy, wherein the nickel-titanium alloy includes a ternary element selected from the group of elements consisting

of platinum, palladium, or tantalum conferring a substantially small stress hysteresis with a ratio of loading plateau stress to unloading plateau stress is about 2:1 to 1.1:1 and a loading plateau of about 110 ksi; and

a filter element disposed on the self-expanding strut assembly.

10. The filtering system of claim 9, wherein the unloading plateau is about 55 ksi.

11. The filtering system of claim 9, wherein self-expanding strut assembly has been heat treated at about 500 degrees C.

12. A filtering system for use in a body lumen, comprising:

a self-expanding strut assembly including a superelastic alloy, wherein the superelastic alloy includes about 30 to 52 atomic percent titanium, at least about 38 atomic percent nickel, and about up to 15 atomic percent of a ternary element selected from the group of elements consisting of platinum, palladium, or tantalum, and wherein a stress hysteresis curve of the alloy includes a loading plateau of about 110 ksi and an unloading plateau of about 55 ksi; and

a filter element disposed on the self-expanding strut assembly.

13. The filtering system of claim 12, wherein the hysteresis curve of the alloy includes an absolute Δy of about 55 ksi.

14. The filtering system of claim 12, wherein the hysteresis curve of the alloy includes a ratio of loading to unloading plateaus stresses of about 2:1.

15. The filtering system of claim 12, wherein the self-expanding strut assembly expands inside the body lumen through shape memory effect.

16. The filtering system of claim 12, wherein the superelastic alloy includes a transition temperature below 45 degrees C.